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and congratulated the Society, on the prospect of a copy being soon obtained for its Library.

Meeting for Business, July 8, 1846.

VICE PRESIDENT MORTON in the Chair.

The Committee on Dr. Leidy's paper on the Anatomy of Spectrum femoratum, Say, reported in favor of publication.

On the Anatomy of Spectrum femoratum, Say.

By JOSEPH LEIDY, M. D.

Spectrum femoratum is one of those singular insects which from their appearance, in localities where they are found, are commonly known under the name of " Walking Sticks."

This species was first described by the distinguished naturalist, formerly in connection with our Society, Thomas Say, and a description and drawing of it will be found in the third volume of his American Entomology. Individual specimens have been found in most parts of the United States, but I have not learned of any place where it is abundant, excepting in the State of Iowa, from whence I obtained my specimens, through Dr. B. J. Kern, who informs me they are found in considerable numbers, frequenting high bluffs or dry exposed situations, creeping on the ground or on decaying timber.

It belongs to the order Orthoptera, family Mantidæ. The male insect measures 2 inches 9 lines in length, and one line in breadth ; the female, 3 inches, 7 lines in length, and 2 lines in breadth at the thorax, and 3½ lines at the abdomen.

The head is oval; the eyes are somewhat protuberant. It has no simple eyes. The antennæ, in the male, are about 2 inches in length ; in the female, 1½ inches ; setaceous, and numerously jointed, the joints (Fig. 1.) being long, oval and hirsute.

The thorax has three segments, the two posterior of which form full one third the length of the whole body. The smallest rudiment of wings does not exist. The anterior and posterior pair of legs, in the male, are two inches in length, the intermediate pair one and one-half inches ; in the female they are all about half an inch shorter. They are narrow, and much separated in the walking position. The thighs of the central pair of legs in the male are comparatively thick and the thighs of the central and posterior pairs, have at their distal extremity an acute projecting spine, long in the male, short in the female. The tarsus (Fig. 2.) is five jointed, each joint being furnished with stiff hairs and at the under part of the distal extremity, a pair of hard, smooth, shining black tubercles. The last joint is armed with two hooked phalanges having placed beneath them a round and thick soft pad. The abdomen has nine segments. The last abdominal segment, in both sexes, is furnished with two short caudal appendages. The external part of the sexual apparatus is articulated with the ventral plate of the seventh abdominal segment.

Of the digestive apparatus. The oral organs are mandibulate or masticatory. The labium (Fig.3,) is in four pieces,two of which are external and one longer than the internal. They are somewhat claviculate in shape,have each a black spot at the extremity and articulate with the mentum, properly a fifth piece to the labium. The labial palpi (Fig. 3, a,) articulate with the mentum, are hirsute, and three-jointed, two of the joints being oval and the third lanceolate in shape. The tongue, (Fig. 4,) which is internal as regards the mouth and is generally considered to belong to the labium, is flat from side to side, of a curved triangular form, corneous in structure, and ciliate upon its upper edge.

The maxillæ (Fig. 5,) are tridentate and slightly hairy. The maxillay palpi (Fig. 5, a.) are five-jointed and hirsute ; the first two joints are subrotund, the next two conical, and the last one lanceolate in form. The mandibulæ (Fig. 6,) are very hard, short, and strong, and present a triangular molar surface, with two of the sides raised into trenchant, sharp edges, resembling very much a gouge, and well adapted for cutting the harder vegetable substances. The labrum (Fig. 7,) is slightly convex and emarginated. The intestinal canal (Fig. 8,) extends in a straight line, the length of the body, from the mouth to the anus, and is broad and capacious throughout. The pharynx is almost null. The œsophagus, at first narrow, after a few lines of its course almost abruptly dilates into a tube of large calibre, extending nearly one half the length of the whole canal, and may be considered in the light of a combined crop and œsophagus, as it appears to be a receptacle of the food, in which the latter undergoes some change preparatory to being received into the stomach, and I will, hence, call it the œsophageal crop. (Fig. 8, a.) Its inferior part (Fig. 9,) becomes contracted in shape like the neck of a Florence flask, and projects into the cavity of the stomach. The orifice opening into the stomach is narrow, and has a valve-like appendage connected to its lip. The exterior or muscular tunic of the œsophageal crop is thick and strong; its transverse fibres are well marked. The epithelium is comparatively thick and tightly adherent to its basement membrane.

This portion of the alimentary canal I found to be full of coarse particles of decaying wood, which I infer to be the food of the animal.

The stomach (Fig. 8, b.) is about half an inch in length, and of very little greater breadth than the preceding receptacle. Its parietes are comparatively thin, and present internally numerous transverse rugæ which pass from a longitudinal ruga in front to a corresponding one behind. The muscular investment is very thin ; the epithelial surface is soft and readily separable from the basement membrane, which latter makes up the greater part of the thickness of the stomach.

The duodenum (Fig. 8, c.) is only distinguishable from the stomach by a narrowing of its capacity and the disappearance of the rugæ. It presents the same structure as the stomach. Its length is about three times that o the latter, and it receives near its middle, where it undergoes a narrow contraction, the biliary vessels. The contained mass of the stomach and duodenum has a pultaceous consistence.

The ilium (Fig. 8, e.) is not more than four lines in length, is exceedingly contracted, and opens directly into the rectum.

The rectum (Fig. 8, f.) is about the same length as the ilium, is moderately capacious, and has thick musculo-epithelial parietes. It presents internally several columns or longitudinal folds, which give a columnar appearance to the excrement of the animal. The anus opens at the extremity of the last abdominal segment between the caudal appendages.

The salivary glands (Fig. 8, g.) two in number, are placed laterally upon the anterior part of the œsophageal crop. In structure they are of the highest order, being granulated or conglomerate, one of the rarest forms in the economy of insect life. Their ducts open into the mouth.

The biliary vessels (Fig. 8, h. Fig. 11,) are numerous, moderately long, and form a double attachment to the duodenum. They are connected at their commencement to the external tunic of the duodenum just above the middle, in three rows, (Fig. 10,) one below the other, from whence they pass downwards nearly to the termination of the duodenum, then doubling upon themselves, running forwards, they finally form the connection of entry about the middle of the duodenum, at the contraction before mentioned, (Fig. 11.) When highly magnified, they present a structure of basement membrane filled interiorly with organic nuclei and cells, (Fig. 12.)

The Generative apparatus.—In the female: The ovaries (Fig. 8, i.) two in number, are placed within the abdomen on each side of the duodenum, and are about 18 lines in length. Each ovary consists of numerous ovigerous tubes (Fig. 13, a.) 4 or 5 lines in length, which commence very narrow, gradually dilate, and join a common tube, the oviduct. The ovigerous tube contain ova in various stages of development, from a mere point at their commencement to the fully formed ovum at their termination. The perfected ova measure 1½ lines in length, are oval and smooth. The oviducts (Fig. 8, j, Fig. 13, b.) are narrower and pass backwards and join each other beneath the ileum to form a common canal, the vagina. The vagina (Fig. 13, c.) is 2½ lines long, its external orifice is placed between an oval ventral plate (Fig. 13, d. Fig. 14, a.) articulating with the extremity of the ventral plate of the sixth abdominal segment, and an upper convex plate provided with four curved and pointed forceps, (Fig. 13, e.) articulating with the seventh abdominal segment, which probably acts the part of an ovipositor.

In the male, the genitalia are very simple. The testes (Fig. 15, a.) consist of a pair of comparatively thick and short tubes, forming each a single convolution, and joining each other beneath the ilium to form the ductus ejaculatorious (Fig. 15, b.) which proceeds to the penis. The penis (Fig. 15, c.) is external to the body, and is placed below the eighth abdominal segment, but articulates with the seventh. It is short, semi-oval in form, with a short pointed process behind, is enveloped by chitinous membrane, and is received in a calx (Fig. 15, d.) formed of chitine, which articulates with a small convex segment attached to the ventral plate of the seventh abdominal segment.

The Nervous system.—The cerebrum (Fig. 17, a.) placed above the œsophagus, in form is like two pyriform bodies placed side by side, with the apices anterior and divergent to the base of the antennæ. From the most anterior part of each lateral mass passes off the antennal nerve, (Fig. 17, b.) and from the external side, just posterior to the latter, the optic nerve, (Fig. 17, c.) From the base of the optic nerve and the cerebrum immediately posterior proceed two small branches, which unite to form a single cord, the analogue of the sympathetic nerve (Fig. 17, d.) which passes backwards along the side of the œsophageal crop, to which, after dividing into two principal branches, it is ultimately distributed by numerous minute twigs. Antero-inferiorly the cerebrum sends off two branches which pass forwards, unite, and form the frontal ganglion (Fig. 17, e.) from which proceeds backwards, beneath the cerebrum, a single cord running along the upper surface of the œsophageal crop nearly to its termination. These two latter branches,the frontal ganglion, and the single resulting cord, constitutes the nervus recurrens, or nervus vagus, (Fig. 17, f.) The nervus vagus, after passing the cerebrum, forms a small swelling, which gives off minute ramuscles to the salivary glands and neighboring part of the œsophageal crop. It also forms a ganglion (Fig. 17, g.) of moderate size upon the lower part of the œsophageal crop, from which proceed six principal nerves to be distributed to the œsophageal crop and stomach.

The ventral cord consists of a chain of eleven ganglia, connected in their length by a double commissure.

The first of this chain, the cerebellum, (Fig. 17, i.) is a cordiform ganglion situated beneath the commencement of the œsophagus, and connected to the cerebrum by its appropriate commissures, gives off the mandibulary, maxillary, and labial nerves.

The three following ganglia are the thoracic ganglia, (Fig. 18, a.) the first of which is simple, the two others double. These give off nerves both to the extremities and to the neighboring parts.

The seven remaining ganglia are the abdominal. (Fig. 18, b.) They are all single and give off numerous minute ramuscles in their vicinity.

Explanations of the figures.

Fig. 1. Part of one of the antennæ of spectrum femoratum, highly magnified.

Fig. 2. Tarsus of do., magnified.

Fig. 3. The labium, magnified; a, the labial palpi.

Fig. 4. The tongue, magnified.

Fig. 5. The right maxilla and palpus, (a,) magnified.

Fig. 6. The right mandibula, magnified.

Fig. 7. The labrum, magnified.

Fig. 8. The intestinal canal, &c., of the female, the size of nature ; a, œsophageal crop ;' b, stomach ; c, duodenum ; e, ileum , f, rectum ; g, salivary glands ; h, biliary vessels ; i, ovaries ; j, oviducts ; k, an ovum in its passage down the oviduct ; l, inferior ganglion of the nervus vagus.

Fig. 9. The inferior portion of the œsophageal crop and stomach laid open.

Fig. 10. Shows the connection of the commencement of the biliary vessels with the duodenum.

Fig. 11. Biliary vessels and place of opening into the duodenum.

Fig. 12. Portion of a biliary tube, highly magnified.

Fig. 13. Lower part of the female generative apparatus; a, an ovigerous tube containing ova; b, lower part of the oviducts; c, vagina; d, oval ventral plate; e, upper plate.

Fig. 14. The posterior four segments of the abdomen of the female; a, oval ventral plate; b, upper plate.

Fig. 15. Genitalia of the male, magnified; a, testus; b, ductus ejaculatorius; c, penis; d, calyx.

Fig. 16. The posterior five segments of the abdomen of the male.

Fig. 17. Magnified view of the cerebrum and cerebellum; a, cerebrum; b, antennal nerve; c, optic nerve; d, sympathetic nerve; e, frontal ganglion; f, nervus vagus; g, ganglion at the termination of the nervus vagus; i, cerebellum.

Fig. 18. Magnified; a, thoracic ganglia of the ventral cord; b, abdominal ganglia.

The Committee on Dr. Hallowell's paper on the Anatomy of Harpyia destructor, reported in favor of publication.

On the Anatomy of Harpyia destructor, Cuv., or Harpy Eagle of South America.

By EDWARD HALLOWELL, M. D.

The animal from which the following description was taken, died in one of the menageries of Philadelphia of a tuberculous affection of the lungs. It is remarkable for the great development of the lower extremities, which are sufficiently powerful to enable it to carry off a goat with facility. It is even stated that it has the power to carry off the dead body of a man, but such accounts are evidently fabulous. It is said to be solitary and to feed upon sloths and other small quadrupeds.

Vertebræ. There are 13 cervical vertebræ. The bodies of the four first are quite short; the seventh measures six and a half lines in depth upon its anterior face; the transverse processes attached to the anterior extremities of these vertebræ are well characterized, the longest being 4 lines in length; a small tubercle exists at the base, at the inner margin of the process in the sixth, seventh, eighth and ninth. Inferior spinous processes are observed in the first, second, fourth and fifth,and from the eleventh to the last; the superior spinous processes are well marked in the second, third, fourth and fifth, and in the tenth, eleventh twelfth and thirteenth; the superior spinous process of the thirteenth is square, and resembles that of the first dorsal, except that its breadth is not so great. There are inferior spinous processes to the five first dorsal; and there is a rudiment of one attached to the sixth; those attached to the third, fourth and fifth are the longest; the middle one of these three is broader at its base than either of the others; the inferior spinous processes of the caudal vertebræ are five in number; a complete foramen for the transmission of an artery exists in each of the four posterior; in the first it is not observed; the bony processes passing from one transverse process to another are well defined, but there is no

Anatomy of Spectrum Femoratum.

Fig. 2.

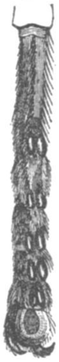


Fig. 1.

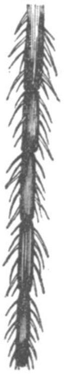
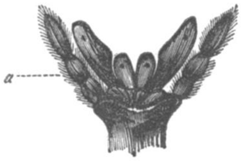


Fig. 3.



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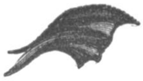


Fig. 5.

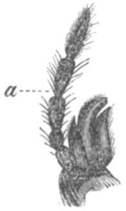


Fig. 6.

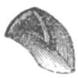


Fig. 7.

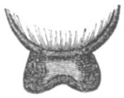


Fig. 8.

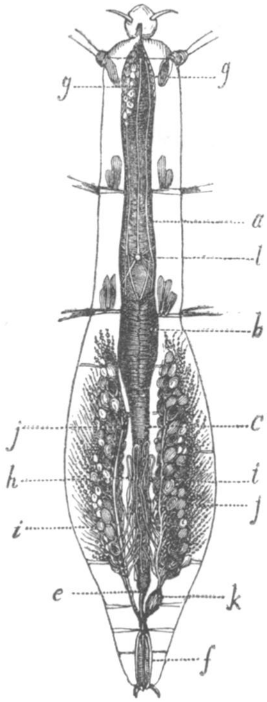


Fig. 9.

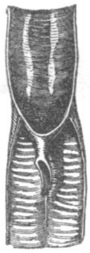


Fig. 10.

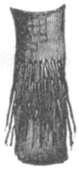


Fig. 11.

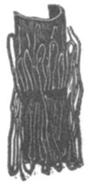
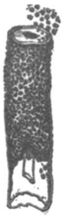


Fig. 12.



Anatomy of Spectrum Femoratum.

Fig. 13.

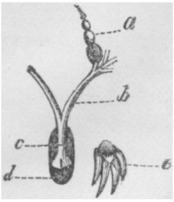


Fig. 14.

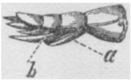


Fig. 15.

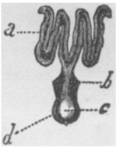


Fig. 16.

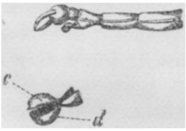


Fig. 17.

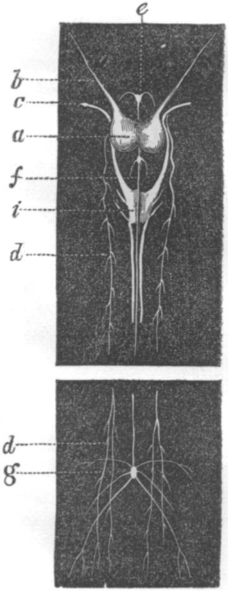
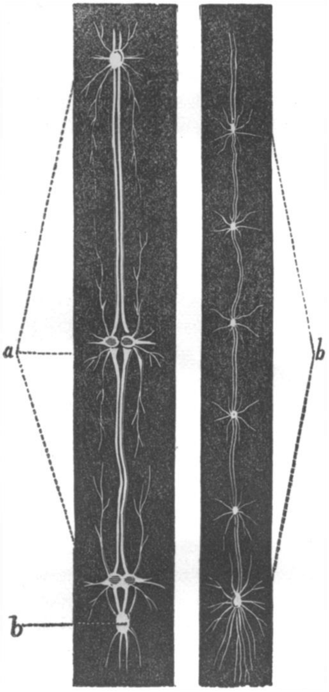


Fig. 18.



anchylosis; there are no spines or processes attached to the anterior face of the lumbo-sacral bone; a slight ridge exists near its posterior extremity; the fourth and fifth transverse processes of the caudal vertebræ are more developed than either of the others; transverse processes are observed in all but the two last; the dorsal spinous process of the penultimate vertebra is well characterized; none of the caudal vertebræ are truly anchylosed; there are eight caudal vertebræ and nine dorsal; the vertebræ present nunumerous foramina for the transmission of air; the spinous processes of the dorsal vertebræ are all separated; none of their bodies are truly anchylosed.

The keel of the sternum is well developed; there are no notches in the posterior border; near its extremity are two large foramina, eleven lines in length, which extend to within two and a half lines of the posterior margin; the coracoid bones are remarkably strong and powerful, being greatly expanded at their base; the furcula is separated from the sternum a distance of nearly half an inch. The scapula and clavicles present nothing remarkable in their conformation; there are eight ribs, two of which appear to be wanting, the pits for their reception being alone observed; the six which exist are attached to the sterno-costal bones; there are caudal appendages to the second, third, fourth and fifth; that of the second meets the anterior margin of the fourth about its middle; none of the ribs are anchylosed with the pelvis.

Cranium. The foramen magnum is nearly horizontal; two well marked depressions exist upon the posterior and inferior aspect of the occipital bone; between them is a small ridge four lines in length; it is very narrow, presenting a marked contrast in this respect with the ridge in the same part in the grey vulture of Africa which measures half an inch in breadth; the supraorbitar and lachrymal bones are of nearly equal length; the former is rounded at its posterior extremity where it presents a broad expansion, the corresponding part of this bone in the grey African vulture terminates in a point; that part of the skull immediately above these depressions is much flattened; the ossa communicantia are seven lines in length and of moderate thickness. The opening for the nostrils is four lines in breadth; the posterior extremity of the lower jaw does not project beyond the upper; the cranium presents generally a smooth surface exteriorly.

Anterior Extremities. The humerous is well developed. On its internal aspect is a well marked ridge, presenting a broad and somewhat rough surface, inclining backwards, beneath which is the hole for the transmission of air; the humerus immediately below this is compressed laterally, having a triangular form; it is concave near its inferior extremity posteriorly, and convex in front; the middle of the bone is smooth and rounded; the inferior articulating surface presents two oblong convexities for articulation with the bones of the forearm, with a narrow fossa between them; there is but one carpal bone in the subject under examination, but there is clearly a smooth articulating surface for another; the radius is a long and slender bone, having about one half the diameter of the ulna; there are two small ridges upon its distal extremity; the ulna has a well marked olecranon process; the metacarpal bone corresponding with the radius has three times the breadth of the bone opposite, at its middle; there are two phalanges to the radial finger; the ulnar phalanx is a slender styliform appendage pointed inferiorly.

The *pelvis* is narrow in front, broad posteriorly ; it presents a small process on each side three lines behind the last rib , that portion of the pelvis comprised between this process and the cotoloid cavity is much compressd; the ossa pubis look backwards as in most birds; the cotyloid cavity is incomplete posteriorly.

Posterior extremities. There is no proper neck to the femur; the large trochanter presents a well marked rough process posteriorly; there is no small trochanter ; on the lower side of the trochanter at its inferior extremity upon the anterior face of the bone, is a foramen three lines in length and two in breadth, for the admission of air ; the outer condyle of the femur is large ; the groove upon inferior part is well marked; there is a rough eminence upon its external face, with a depression in front of it; the upper surface of the tibia is flat for the most part; the anterior margin projects considerably beyond the anterior face of the bone, but there is no spine extending upwards as in some birds ; the superior extremity of the tibia is remarkable for the deep pit which it presents upon its posterior face ; it measures twelve lines in length ; there are two holes at its distal extremity situated posteriorly, with an oblique ridge between them; it is triangular in form above, rounded in the middle, and flattened inferiorly; a marked depression exists upon the anterior face of it, at its inferior extremity. The foramen for the transmission of the interosseous artery is placed two and a quarter inches from the head of the tibia, about a line from its junction with the fibula ; the fibula is a slender bone anchylosed with the tibia in the greater part of its extent, as in other birds. The tarso metatarsal is the most remarkable bone in the body ; it is a large and powerful bone, concave posteriorly, presenting numerous very well marked depressions and elevated ridges upon its anterior aspect; there is a foramen for the transmission of air near its outer margin, five lines from its proximal extremity; there is also another two lines in breadth, and two in extent, near its inner margin, within two and a half lines of the superior margin of the outer groove, at the extremity of the bone; the outer aspect of the bone is flat in nearly its whole extent, presenting a smooth surface ; it measures seven lines in an antero-posterior direction at its middle ; its inner margin forms a sharp edge extending the whole length of the bone as far as its junction with the accessory bone, for the articulation with the first phalanx of the powerful back toe ; the articular eminences at the extremity of the bone are separated from each other by intervals each about two lines in breadth ; the middle eminence is the largest; the remaining two are of nearly equal size ; the articulation of the accessory bone is placed seven lines and a half above the level of the anterior toes ; the accessory bone is large and triangular in shape, presenting a smooth surface for its articulation with the first phalanx of the hind toe ; its posterior margin measures thirteen lines in length; it presents a sharp edge continuous with that of the inner margin of the tarso metatarsal bone for seven lines of its extent, the remaining portion being expanded laterally, and presenting a somewhat oval and rough surface. The toes are strongly developed; the back toe and inner toe are the most powerful; the first phalanx of the inner toe is remarkable for its shortness; it is somewhat quadrangular in shape, and presents a deep groove upon its posterior extremity, for articulation with the tarso-metatarsal bone.

Measurements.

	Feet.	*Inches.*	*Lines.*
Height, measured from extremity of beak to extremity of middle toe,	1	7¾	0
Bi-parietal diameter of head		2	5
Vertical, do. do.		1	8
Depth of upper mandible at base,		1	
" lower " "			3
Length of lower mandible,		3	
" upper following the curve		2	4
Breadth of coracoid bone at base,		1	3
Width of interspace between clavicles at time of junction with posterior and superior margin of coracoid bone,		2	4
Length of scapula,		4	
Length of sternum measured from anterior extremity of keel,		4½	
Breadth of sternum		2	
Greatest depth of keel of sternum,			11½
Length of fourth sterno-costal bone,		1	2
Breadth of pelvis anteriorly,		1	5
Greatest breadth posteriorly,		1	10
Distance between anterior extremity of pelvis and posterior margin of cotyloid cavity,		2	8
Distance between anterior margin of cotyloid cavity and posterior extremity of pelvis,		2	11
Length of lumbo-sacral bone,		2	19
" caudal vertebræ,		2	
" last bone of coccyx,		1	5
" humerus,		6	9
" radius,		7	7
" ulna,		8	2
" metacarpus,		3	4
" hand,		2	
" thumb,		1	
" first phalanx of radial finger,		1	2
" second " " "			10½
" ulnar " " "			5½
Breadth of first " " "			5
Length of femur,		4	8
" tibia,		5	4
" fibula,		4	7½

	Inches.	*Lines.*
Length of tarso-metatarsal bone,	3	9
" proximal phalanx of hind toe,	1	6
Breadth at proximal extremity,	1	
Length of distal or terminal phalanx of hind toe at base,		5½
" proximal or first phalanx of inner toe,		5½
" second " "	1	4
" third " "		5
" first phalanx of middle toe,		14
" second " "		7½
" third " "	1	
" fourth at base,		3
" first phalanx of outer toe,		6
" second " "		3
" third " "		2¼
" fourth phalanx of outer toe,		11
" fifth at base, (along inferior surface,)		3
" hind claw measured along its upper curve,	3	1
" inner claw,	2	5½
" middle claw,	1	8
" outer claw,	1	4
Distance between distal extremity of hind claw and distal extremity of middle claw,	7	5
Distance between distal extremity of hind claw and distal extremity of inner claw,	5	3

(*To be continued.*)

The Monthly report of the Corresponding Secretary was read and adopted.

ELECTIONS.

Elisha J. Lewis, M. D., of Philadelphia, was elected a member:

And Mr. Edward Wilson, formerly of Philadelphia, now of London,

And M. de Vernueil, President of the Geological Society of France, were elected Correspondents of the Academy.